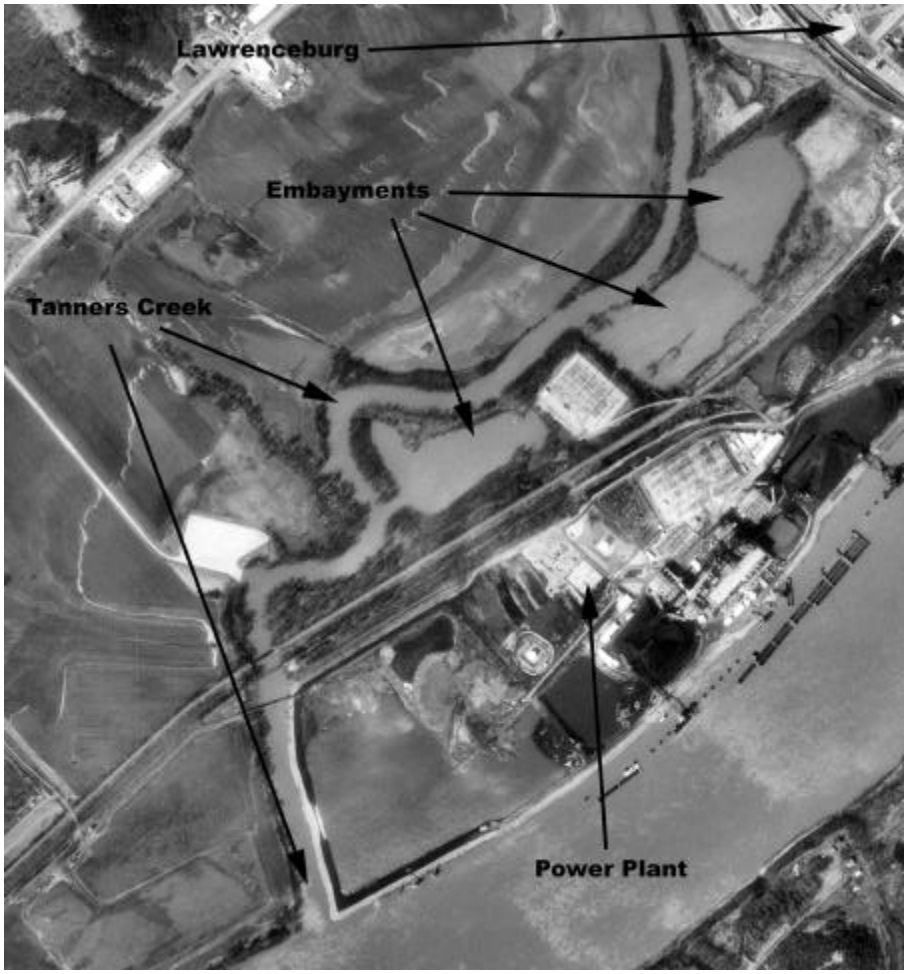
Tanners Creek Embayment Restoration (IN-90)

1.0 Location

The proposed Tanners Creek Embayment Restoration Project site is located in Dearborn County, Indiana near the western edge of the town of Lawrenceburg, Indiana. The mouth of Tanners Creek enters the Markland Pool at Ohio River Mile (ORM) 494.8. The Great Miami River, which serves as the boundary between the States of Indiana and Ohio, is approximately 4 miles upstream from the Tanners Creek confluence with the Ohio River. Indiana Michigan's (American Electric Power) Tanners Creek Power Plant is located immediately adjacent to the Tanners Creek site. The Tanners Creek site is within the jurisdiction of the Louisville District, U.S. Army Corps of Engineers (USACE).



2.0 Project Goal

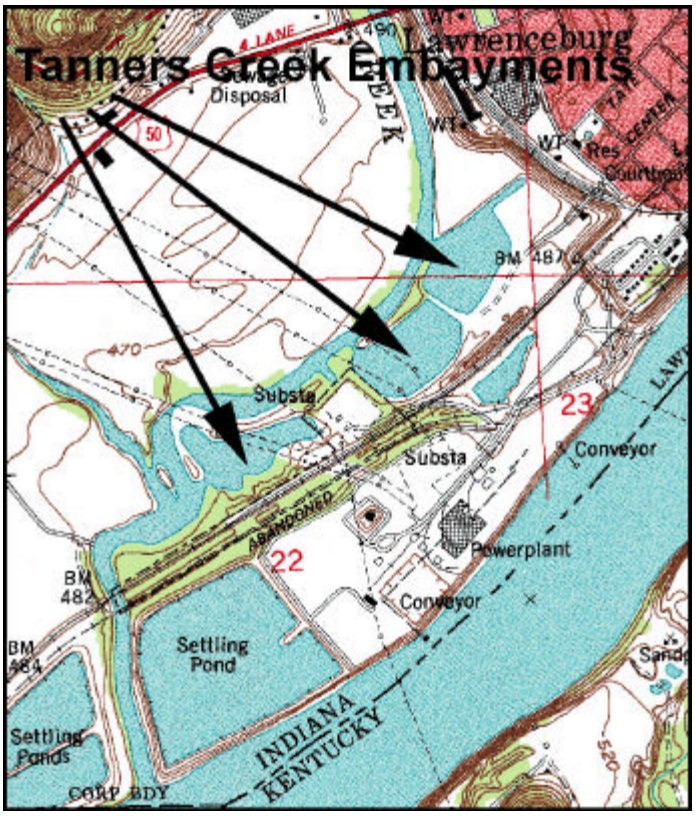
Ohio River embayments have historically provided important and diverse off-channel habitat for many fish species. Over the years many of the embayments have silted in and no longer maintain the quality or diversity of habitat previously provided.

The primary goals of the Tanners Creek Embayment Restoration project are to restore the aquatic backwater habitat in the embayment. The restoration will provide improved reproductive, feeding, nursery, high water refuge, seasonal migration, and overwintering habitat for fishes in the Ohio River. Enhanced spawning and over-wintering habitat along with increased habitat diversity would improve species diversity, facilitate a sustained fishery resource, and improve the recreational fishery in the area.

3.0 Project Description and Rationale

Habitat restoration at the Tanners Creek Embayment site will focus on the three shallow backwater embayments connected to Tanners Creek proper. Tanners Creek proper is a high quality tributary with adequate depth and habitat diversity. The three embayments adjacent to

Tanners Creek will be restored by dredging each area to an approximately 10-12 foot depth in the central portion of each embayment. The area to be dredged will include the majority of each existing embayment. The dredging will be at a 3:1 slope resulting in a new channel sloping from the shoreline to approximately 12 feet in depth along the centerline of each area. The overall size of each embayment area will remain unchanged. Dredge material will be placed/dewatered in the undeveloped and/or agricultural fields adjacent to the site.



In addition to dredging Embayment # 1 an opening near the northeast end of the embayment will be created allowing Tanners Creek to flow directly into the embayment. This would result in the establishment of an island and associated backchannel within Tanners Creek, thereby creating a unique habitat within the project area and increasing habitat diversity.

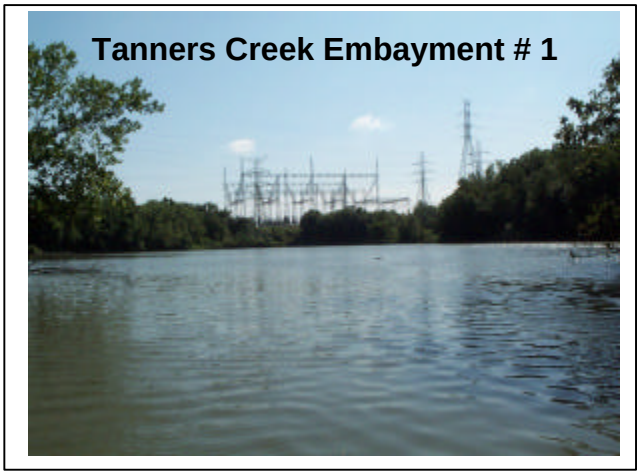
The Tanners Creek Embayment project will result in three deep-water embayments and a new side channel/island adjacent to and connected to Tanners Creek. The project will provide valuable off channel, slack water habitat for spawning, nursery areas, and over wintering habitat for multiple fish species.

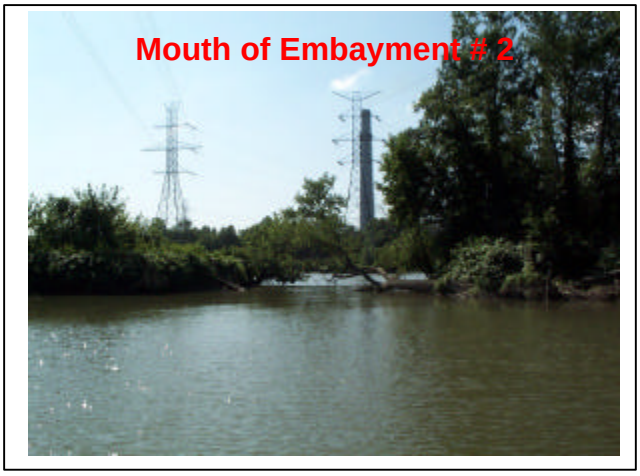
4.0 Existing Conditions

Terrestrial/Riparian Habitat: Tanners Creek Embayment is surrounded by a narrow riparian band of mature trees. Silver maples (Acer saccharinum) are the dominant tree within the riparian community. Adjacent to the riparian band are the Tanners Creek Power Plant along the southeastern portion of the area and open field/agricultural fields/wastewater treatment plant along the northwestern portion of the site. Although adjacent to the town of Lawrenceburg, the project area supports a variety of wildlife. Great-blue heron, coots, and Canada geese were observed in the project area during the site visit.

Aquatic Habitats: Tanners Creek supports a diverse aquatic ecosystem. Sport fishermen utilize the area frequently. Bass tournaments are also common on the Ohio River in the vicinity of Tanners Creek. A large boat ramp is located on Tanners Creek, within the project area, to facilitate recreational use of Tanners Creek and the Ohio River. Largemouth bass, channel catfish, flathead catfish, and other fish species are common in the area.

Tanners Creek proper is a winding stream with a variety of near shore stumps and fallen trees that provide instream cover for fishes. Water depths in the main channel of the creek range from 9 to 14 ft in depth. The three embayments within the project area consist of shallow pond-like areas 1 to 3 feet in depth. These areas have bottoms comprised of soft sediments (silt and clay). Some instream cover in the form of fallen logs is present in these embayments. Several small islands associated with transmission line towers exist within Embayment 2.





Wetlands: Herbaceous wetlands are present along the margins of the three embayment areas within the project area. The wetland areas in Embayments 1 & 2 are limited to the embayment edge. The herbaceous wetlands in Embayment 3 are more extensive, due to the shallower water, and extend into the embayment approximately 60 to 100 feet. In addition to the

herbaceous wetlands in the project area, portions of the riparian forested band adjacent to the embayments may also be considered jurisdictional wetlands.

Federally-Listed Threatened and Endangered Species

According to the U.S. Fish and Wildlife Service (USFWS), there are two federally-listed endangered species known to occur in Dearborn County, Indiana. These two species are shown on Table 1. State listed species are included in Appendix A.

Table 1. Federally-listed species known to occur in Dearborn County, Indiana.

Common Name	Scientific Name	Federal Status	Habitat Present
Interior least tern	*Sterna antillarum*	Endangered	No
Running buffalo clover	*Trifolium stoloniferum*	Endangered	No

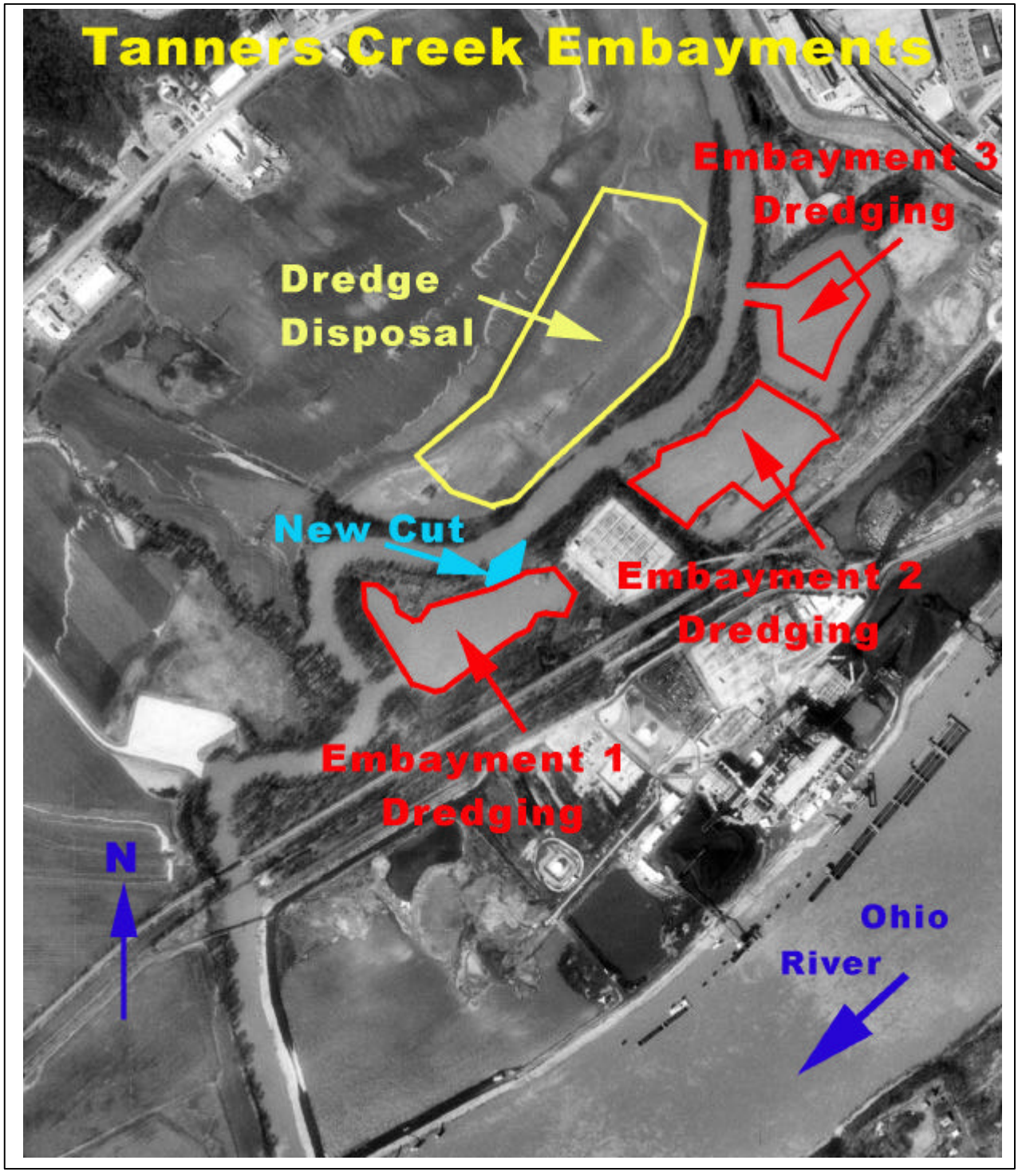
Source: U.S. Fish and Wildlife Service, 1999

Least terns are typically associated with sand bar / beach habitats. This species is known to nest on unvegetated sand bars and islands. This habitat is not present in the project area.

There is currently little information related to life history of running buffalo clover. Habitat for this species is believed to have been in disturbed areas with rich soil in the ecotone between open forest and prairie, and these disturbed habitats were believed to have been caused by large herbivores (i.e. buffalo) (Campbell, 1985).

Dredge Material Disposal Area. Adjacent to the riparian band along the banks of Tanners Creek are areas containing open field/agricultural fields/wastewater treatment plant along the northwestern portion of the site. These areas, within the floodplain of the Ohio River, will be used for dredge material disposal.

5.0 Project Diagram



6.0 Engineering Design, Assumptions, and Requirements

6.1 Existing Ecological/Engineering Concern

Tanners Creek proper is a high quality tributary with adequate depth and habitat diversity. The three embayments adjacent to Tanners Creek were most likely borrow pits used in the construction of the power plant. The embayments have slowly silted in

due to the sediment load being deposited during high water from Tanners Creek and the Ohio River.

6.2 Embayment Dredging

6.2.1 Embayment 1

Maintenance dredging of this 11-acre embayment is required to provide deep water connectivity to the remainder of the embayment and to provide a suitable depth for boater access. An estimated 98,000 cubic yards of silty-clay material would be dredged to restore depths of 9-12 feet with 3:1 side slopes.

In addition to the dredging the embayment. An opening near the northeast end of the embayment would be created to allow Tanners Creek to flow directly into the embayment. This would result in the establishment of an island and associated backchannel within Tanners Creek, thereby creating a unique habitat within the project area and increasing habitat diversity.

6.2.2 Embayment 2

Maintenance dredging of this 11.6-acre embayment is required to provide deep water connectivity to the remainder of the embayment and to provide a suitable depth for boater access. An estimated 136,000 cubic yards of silty-clay material would be dredged to restore depths of 9-12 feet with 3:1 side slopes.

Two power line support structures are within Embayment 2. No dredging would occur adjacent to these structures.

6.2.3 Embayment 3

Maintenance dredging of this 12.6-acre embayment is required to provide deep water connectivity to the remainder of the embayment and to provide a suitable depth for boater access. An estimated 101,000 cubic yards of silty-clay material would be dredged to restore depths of 9-12 feet with 3:1 side slopes.

No dredging would within 100 feet of the existing embayment banks in order to protect the emergent wetland.

6.2.4 Geotube Levee

A dredge disposal site is adjacent to the embayment. A small geotube levee, 3400 feet in length would be constructed at the designated disposal site for dewatering.

Example of Geotube Levee

6.3 Planning/Engineering Assumptions

- A small auger head dredge would be used, and the material would be pumped directly to the disposal site.
- Bottom side slopes will be reshaped to a 3:1.

7.0 Cost Estimate (Construction)

Dredging - Engineering costs for the proposed project are contained on Table 1. A detailed MCACES cost estimate for the proposed project is included in Appendix D.

Table 1. Engineering Costs.	
Dredging Embayment 1	$123,000
Channel Excavation	$37,801
Dredging Embayment 2	$170,600
Dredging Embayment 3	$126,700
Geotube Levee	$51,800
Mobilization	$144,900
TOTAL	**$654,800**

8.0 Schedule

Tanners Creek Embayment Dredging: The estimated construction time is shown on Table 2.

Table 2. Construction Schedule.

Item – Embayment 1	Time
Dredging Embayment 1	180 Days
Create Back Channel	5 Days
Dredging Embayment 2	188 Days
Dredging Embayment 3	209 Days
Mobilization	4 Days
TOTAL	**586 Days**

9.0 Expected Ecological Benefits

Terrestrial/Riparian Habitat: Since most of the impacts associated with the Tanner Creek Embayment project would be in-stream, there would be no reasonably foreseeable beneficial impacts to terrestrial/riparian resources.

Aquatic Habitats: Long-term beneficial impacts to aquatic resources would be anticipated as a result of implementing the proposed project. Dredging of the Tanners Creek Embayments would result in long-term beneficial impacts to fishes due to the improved/deepened embayment habitat. Fishes would be allowed free access to the embayment, especially during low flow periods. Habitat requirements for fishes change seasonally and improved access to the embayment would be considered beneficial. Restoring/increasing the depths of the embayment would provide over-wintering habitat for fishes, especially sport fish such as black basses (Sheaffer, 1986). The project would result in an overall improvement of the off channel, slack water aquatic habitat in the area.

Wetlands: There would be no reasonably foreseeable beneficial impacts to jurisdictional wetlands as a result of dredging the Tanners Creek Embayments.

Federally-Listed Threatened and Endangered Species: There would be no reasonably foreseeable beneficial impacts to federally listed endangered species (interior least tern or buffalo running clover) or stated listed species as a result of dredging the Tanners Creek Embayments.

Socioeconomic Resources: There would be short-term and long-term beneficial impacts to socioeconomic resources as a result of implementing the proposed project. The short-term beneficial impacts would be related to costs and local expenditures associated with the dredging of Tanners Creek. Long-term socioeconomic benefits would be realized through improved recreational fishing opportunities. Long-term indirect beneficial impacts will be realized through local expenditures for fishing tackle, bait, food, gas, and other associated products.

10.0 Potential Adverse Environmental Impacts

Terrestrial/Riparian Habitat: There would be short-term adverse impacts to terrestrial/riparian resources as a result of implementing the proposed project. There would be short-term adverse impacts to terrestrial species from construction-related noise and disturbance. Considering the existing high volume of disturbance from barge traffic along the Ohio River and recreational boat usage in the area, it is likely that the increased noise/disturbance impacts would be very minor.

There would be short-term adverse impacts to approximately 32 acres of agricultural land adjacent to Tanners Creek. This area, which is privately owned and currently farmed, would

serve as the dredge disposal site. Adverse impacts to this area would be considered short term, because it is assumed that the site can be farmed following the dewatering and grading of the spoil material. The agricultural field provides little habitat for terrestrial wildlife, and any adverse impacts to terrestrial wildlife would be minimal and short term.

Aquatic Habitats: There would be a potential for adverse affects to aquatic species, especially immobile benthic invertebrates and young-of-the-year fishes during the dredging of Tanners Creek Embayment. Localized populations of benthic invertebrates could be directly disturbed during the construction operation. In addition, sensitive aquatic species immediately downstream from the site could be adversely impacted by degraded water quality associated with displaced sediments, however these adverse impacts to aquatic species would be short term.

Wetlands: There would be long-term adverse impacts to jurisdictional wetlands as a result of implementing the proposed project. Portions of the herbaceous emergent wetlands that populate a portion of embayment # 3 as well as the margins of all three embayments would be removed during the embayment restoration dredging. The functional capacity of approximately 1 to 4 acres of jurisdictional wetlands will be degraded or removed. The loss of jurisdictional wetlands could be mitigated at an approved wetland mitigation site.

Federally-Listed Threatened and Endangered Species: There would be no adverse affects to federally-listed threatened and endangered species (least tern or buffalo running clover) or state listed species as a result of implementing the Tanners Creek Embayment project.

Socioeconomic Resources: There would be short-term adverse impacts to socioeconomic resources as a result of implementing the Tanners Creek Embayment project. The short-term adverse impacts would be associated with the temporary loss of farming at the dredge material disposal site. These impacts would be short term because it is assumed that the disposal area can be farmed following the completion of the dredge material dewatering.

11.0 Mitigation

Minor impacts associated with site dredging and spoil placement may occur during the construction of this project, however, no significant adverse impacts are expected. The use of best management practices and proper construction techniques would minimize adverse water quality impacts.

Following the completion of the dredging and spoil dewatering operation, the dredge disposal site will be graded and restored for agricultural purposes. This will allow the affected landowners to resume farming.

Jurisdictional wetlands present in the Tanners Creek Embayments would be adversely impacted during the restoration of the embayments. Mitigation via the creation of new wetlands could occur on or near the Tanners Creek site in conjunction with the embayment restoration.

12.0 Preliminary Operation and Maintenance Costs:

Tanners Creek Embayment Operation and Maintenance costs are summarized on Table 4.

Table 4. Operation and Maintenance Costs (50 Year Life)

Maintenance	Frequency	Costs
Maintenance Dredging of Tanners Creek	5 Years	$458,100

13.0 Potential Cost Share Sponsor(s)

- USDA-Natural Resources Conservation Service
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- Indiana Department of Natural Resources
- The Nature Conservancy
- Ducks Unlimited
- Local or County Government
- Local Economic Development Council
- Indiana Bass Federation or local BASS chapters
- Private corporations or marinas

14.0 Expected Life of the Project

The anticipated life of the project is 50 years.

15.0 Hazardous, Toxic, and Radiological Waste Considerations

Potential impacts of hazardous, toxic, and radiological waste (HTRW) at the site were visually assessed during a site visit and further assessed via a database search of HTRW records in the site area.

Site Inspection Findings. The project area includes the mouth of Tanner Creek and an extension of the creek upstream about 1.5 miles. Tanner Creek flows to the Ohio River at river mile 494.8. In the project area, the town of Lawrenceburg, IN is located on the Ohio River and extends for about one mile along the east bank of Tanner Creek slightly upstream of the creek's mouth.

The following environmental conditions were considered when conducting the project area inspection:

- Suspicious/Unusual Odors;
- Discolored Soil;
- Distressed Vegetation;
- Dirt/Debris Mounds;
- Ground Depressions;
- Oil Staining;
- Above Ground Storage Tanks (ASTs);
- Underground Storage Tanks (USTs);
- Landfills/Wastepiles;
- Impoundments/Lagoons;
- Drum/Container Storage;
- Electrical Transformers;
- Standpipes/Vent pipes;
- Surface Water Discharges;
- Power or Pipelines;
- Mining/Logging; and
- Other

The Tanners Creek Power Plant operated by American Electric Power is in the project area. Also in the project area is a city boat ramp, agricultural land, new construction, power lines and wastewater impoundments. Aside from electric powerlines, and impoundments, none of the other environmental conditions listed above were seen in the project area.

Risk Management Data Search. A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR). The search complied with ASTM Standard Practice for Environmental Site Assessments, E 1527-97. The search report with maps showing the search area around the project site is presented in Appendix B. The search distance was configured to include the area of the project and a one mile buffer zone beyond the center-point of the project area. It was conservatively assumed that any environmental conditions beyond the project area buffer zone would not impact the project. As depicted on the

report maps (see Appendix B), the radius encompassed the mouth of Tanners Creek to 0.5 miles north of the Eads Parkway Bridge (Hwy 50) which crosses the creek. The majority of the town of Lawrenceburg, IN was included in the database search area. The HTRW activities and distance searched for each environmental item (e.g., USTs, NPL sites, etc.) are as follows:

Databases	Search Radius (Miles)
NPL: National Priority List	1.00
Delisted NPL	1.00
RCRIS-TSD: Resource Conservation and Recovery Information System	1.00
SHWS: State Hazardous Waste Sites	1.00
CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System	1.00
CERC-NFRAP: Comprehensive Environmental Response, Compensation, and Liability Information System	1.00
CORRACTS: Corrective Action Report	1.00
SWF/LF: Available Disposal for Solid Waste in Illinois- Solid Waste Landfills Subject to State Surcharge	1.00
LUST: Leaking Underground Storage Tank	1.00
UST: Underground Storage Tank	1.00
RAATS: RCRA Administrative Tracking System	1.00
RCRIS-SQG: Resource Conservation and Recovery Information System for Small Quantity Generators	1.00
RCRIS-LQG: Resource Conservation and Recovery Information System for Large Quantity Generators	1.00
HMIRS: Hazardous Materials Information Reporting System	1.00
PADS: PCB Activity Database System	1.00
ERNS: Emergency Response Notification System	1.00
FINDS: Facility Index System	1.00
TRIS: Toxic Chemical Release Inventory System	1.00
NPL Liens: NPL Liens	1.00
TSCA: Toxic Substances Control Act	1.00
MLTS: Material Licensing Tracking System	1.00
IN Spills: Indiana Spills	1.00
ROD: Record of Decision	1.00
CONSENT: Superfund (CERCLA) Consent Decrees	1.00
Coal Gas: Former Manufactured gas (Coal Gas) Sites	1.00
MINES: Mines Master Index File	1.00

The following HTRW conditions were identified within the database search radius:

- 9 Leaking Underground Storage Tanks (LUSTs);
- 22 USTs;
- 6 RCRA Small Quantify Generators;
- 1 facility with PCB activity;
- 1 coal Gas Site
- 4 Reportable Spills

The coal gas site is located on the west side of Lawrenceburg about 200 yards south of Hwy 50 and about 200 yards east of Tanner Creek just inside (east) of the railroad tracks which run north-south on the west side of the town. The coal gas site is identified as Lawrenceburg Gas Co. No details about the site and extent of contamination were contained in the database search records. Coal gas sites represent the potential for groundwater and soil contamination. Two of the four reportable spills noted in search records affected Tanner Creek in the project area. One was a 10,000,000 sewerage discharge from Lawrenceburg Muncie Utilities in 1990. The other was a 2,800 gallon gasoline spill, which occurred in 1994.

HTRW Findings and Conclusions. An inspection of the project site revealed no visual evidence of recognized HTRW problems in connection with this project site. The search of environmental records relevant to the project site and within the search radius revealed the presence of a coal gas site about 200 yards east of Tanner Creek near the project area and two reportable spills in 1990 and 1994 that affected the creek. The presence of the coal gas site

within the Tanners Creek watershed upstream of the embayments is noteworthy because potential contamination at the site could impact the project area. Sediment sampling is recommended prior to dredging to assure that the sediments in the embayments are suitable for disposal on the land adjacent to the project site.

16.0 References

References:	
Scott, 1989	Scott, M.T. and L.A. Nielson. 1989. Young fish distribution in backwaters and main-channel borders of the Kanawha River, West Virginia. Journal of Fisheries Biology No. 35 (Supplement A) pp. 21-27.
Sheaffer, 1986	Sheaffer, W.A. and J.G. Nickum. 1986. Backwater areas as nursery habitats for fishes in Pool 13 of the Upper Mississippi River. Hydrobiology No. 136 pp. 131-140.
Sheehan, 1994	Sheehan, R.J., W.M. Lewis, and L.R. Bodensteiner. 1994. Winter habitat requirements and overwintering of riverine fishes. Fisheries Research Laboratory, Southern Illinois University, Carbondale, Illinois. Final Report F-79-R-6.
USFWS, 1999	U.S. Fish and Wildlife Service, July 1, 1999. Federally Listed Endangered and Threatened Species in Indiana.

APPENDIX A Threatened & Endangered Species

APPENDIX B Hazardous Toxic and Radiological Wastes

APPENDIX C Plan Formulation and Incremental Analysis Checklist

Project Site Location:

The proposed Tanners Creek Embayment Restoration Project site is located in Dearborn County, Indiana near the western edge of the town of Lawrenceburg, Indiana. The mouth of Tanners Creek enters the Markland Pool at Ohio River Mile (ORM) 494.8. Indiana Michigan's Tanners Creek Power Plant is located immediately adjacent to the Tanners Creek site. The Tanners Creek site is within the jurisdiction of the USACE Louisville District.

Description of Plan Selected:

The primary goals of the Tanners Creek Embayment project are to restore the aquatic backwater habitat in the embayment. The restoration will provide improved reproductive, feeding, nursery, high water refuge, seasonal migration, and overwintering habitat for fishes in the Ohio River. Enhanced spawning and over-wintering habitat along with increased habitat diversity would improve species diversity, facilitate a sustained fishery resource, and improve the recreational fishery in the area.

Alternatives of the Selected Plan:

Smaller Size Plans Possible? **Yes** and description

Reduce the amount of dredging.

Larger Size Plan Possible? **Yes** and description

Increase the amount of dredging.

Other alternatives? **Yes** (related to increase dredging)

Restore/Enhance/Protect Terrestrial Habitats? No **Objective numbers met**

Restore, Enhance, & Protect Wetlands? No **Objective numbers met**

Restore/Enhance/Protect Aquatic Habitats? Yes **Objective numbers met** A1,A5,A7

Type species benefited: A wide variety of fish species.

Endangered species benefited: None

Can estimated amount of habitat units be determined: Approximately 35 acres of embayment habitat will be created/restored.

Plan acceptable to Resources Agencies?

U.S. Fish & Wildlife Service?
State Department of Natural Resources? **Yes** – Indiana DNR

Plan considered complete? **Connected to other plans for restoration?**

Real Estate owned by State Agency? No **Federal Agency?** No
Real Estate privately owned? Yes
If privately owned, what is status of future acquisition? Acquisition or agreements will be required

Does this plan contribute significantly to the ecosystem structure or function requiring restoration? What goal or values does it meet in the Ecosystem Restoration Plan?

Provide habitat diversity, spawning and nursery habitat, and winter velocity shelters for fishes.

Is this restoration plan a part of restoration projects planned by other agencies? (i.e. North American Waterfowl Management Plan, etc.)

No

In agencies opinion is the plan the most cost effective plan that can be implemented at this location?

Can this plan be implemented more cost effectively by another agency or institution?
Yes / No
Who:

From an incremental cost basis are there any features in this plan that would make the project more expensive than a typical project of the same nature? For embayment type plans is there excessive haul distance to disposal site? More expensive type disposal? Spoil that requires special handling/disposal?

Potential Project Sponsor:

Government Entity:_____
Non-government Entity _____

Corps Contractor _____Date_____

U.S. Fish & Wildlife Representative _____Date_____

State Agency Representative _____Date _____

U.S. Army Corps of Engineers Representative _____Date _____

Terrestrial Habitat Objectives

T1 Riparian Corridors

T2 Islands

T3 Floodplains

T4 Other unique habitats (canebrakes, river bluffs, etc.)

Wetland Habitat Objectives

W1 Forested Wetlands: Bottomland Hardwoods

W2 Forested Wetlands: Cypress/Tupelo Swamps and other unique forested wetlands

W3 Scrub/Shrub Emergent Wetlands: isolated from the river except during high water and contiguous (includes scrub/shrub wetlands in embayments and island sloughs)

Aquatic Habitat Objectives

A1 Backwaters (sloughs, embayments, oxbows, bayous, etc.)

A2 Riverine submerged and aquatic vegetation

A3 Sand and gravel bars

A4 Riffles/Runs (tailwater)

A5 Pools (deep water, slow velocity, soft substrate)

A6 Side Channel/Back Channel Habitat

A7 Fish Passage

A8 Riparian Enhancement/Protection

APPENDIX D Micro Computer-Aided Cost Engineering System (MCACES)